

Appendix F: Systematic Approach for Operational Impact and Risk Management Analysis

This appendix outlines a systematic approach for conducting an operational impact and risk management analysis for utility privatization at the base level. The recommended process incorporates the guidelines and procedures identified in Air Force Pamphlet (AFP) 91-214, 1 September 1997, Operation Risk Management Implementation and Execution. The six steps of the operational risk management process include the following:

- Identification of hazards
- Risk assessment
- Analyze risk control measures
- Make control decisions
- Implement risk controls
- Supervise and review

A utility privatization vulnerability assessment completed by an Air Staff Integrated Process Team (IPT) is attached to this appendix. The IPT vulnerability assessment developed boiler-plate tables containing the risk assessments of the five major vulnerabilities to utility privatization:

- Quality and availability of utilities
- Ability to respond to contingencies and deployments (readiness)
- Vulnerability to terrorist or criminal threat (security)
- Vulnerability of base population
- Vulnerability of government liability

Each table consists of a matrix that breaks down the common hazards of the five composite elements of a system (mission, man, media, machine, and management). The matrix also includes the typical probability and severity (consequences) for each hazard. The matrix then identifies the standard risk level (high, medium, and low) for each hazard. These risk levels are determined by applying the given probability and severity to a risk assessment matrix.

The boiler plate tables provided in the Air Staff IPT vulnerability assessment should be used as a starting point for conducting operational impact analysis for potential privatization projects at the installation level. However, the primary vulnerabilities,

potential hazards, probabilities and severity need to be tailored to fit the specific conditions for each project being.

Once a risk assessment is complete, the assessment must be scrutinized for unacceptable risk. Potential hazards with high and medium risk levels require additional investigation to determine specific strategies and tools to reduce one of the three risk components (probability, severity, or exposure) and thus the overall risk level. Because of the importance of the utility infrastructure to the Air Force mission, potential hazards with high risk levels can not be tolerated in the utility privatization program. Additional studies must be performed to develop mitigating strategies for these hazards with a high risk level. If mitigating strategies are not available for a high risk level hazard, the problem must be documented and the project referred to the Air Staff for additional evaluation and potential elimination from the privatization program.

When adequate risk controls are available, control decisions are then made based on an analysis of the overall cost and benefits. After control strategies are selected, the controls are implemented, usually by inserting a requirement into the request for proposal and other privatization documents. These additional requirements will in turn be reflected in the cost of privatization evaluated in the economic analysis. As with other iterative processes, the controls implemented must be reevaluated to determine their effectiveness. This step is accomplished in the privatization process by completing an economic analysis.

Attachment to Appendix F: Guidance for the Operational Impact Analysis

Utilities Privatization Vulnerability Assessment, Integrated Process Team Background

During the 13 February 1998 Air Force Council addressing the Secretary of Defenses' (SECDEF's) Defense Reform Initiatives, Mr. Peters, SAF/US, directed the creation of an IPT to assess what must be done to ensure utility vulnerability/security issues are not overlooked during the utility privatization process.

IPT composition would include XP; IL; AQ; SF; and, IG.

IPT Charter

- To evaluate the mission impact of utilities privatization in regards to vulnerability/security.
- To determine the means to ensure this oversight occurs. To determine the office of primary responsibility for these issues.

End Product

Concept paper for SAF/US approval, which will address the major issues in utility vulnerability/security as a result of utilities privatization, who's addressing them, and how they are being approached.

Abstract

The AF depends on its infrastructure, physical, and cyber to support its mission. The assets involved in the infrastructure must be protected to prevent disruptions, minimize damage, and to restore in minimum time in the event of damage.

The AF utilities privatization effort directly supports the SECDEF's initiative to privatize all Department of Defense (DoD) utility systems by 1 January 2000. Mr. Peters wants to ensure that vulnerability/security issues are addressed and taken care of during the execution of the utilities privatization program.

Utility vulnerability/security is currently addressed in various fronts dealing with assessments, mitigation, and counteraction. The following list is illustrative and not all encompassing:

- Department of Defense Directive (DoDD) No. 5160.54, Critical Asset Assurance Program, 20 January 1998
- Air Force Energy Program Procedural Memorandum (AFEPPM) 96-1, 1 June 1996
- Air Force Instruction (AFI) 91-213, Operational Risk Management (ORM) Program, 1 September 1997

- Department of Defense Instruction (DoDI) 2000.12, DoD Combating Terrorism Program, 15 September 1996
- AFI 31-209, the Air Force Resource Protection Program
- AFI 31-210, AF Antiterrorism Program, 1 July 1997.

Discussion

The AF utility privatization process is a two-year process that consists of three phases:

- 1) The Preliminary Feasibility Assessment Phase (requirement, feasibility, and commitment of resources)
- 2) The Comprehensive Analysis and Approval Phase (supporting data, the recommendation, and approval)
- 3) Privatization Implementation Phase (approval and recommendation). One of the required activities in Phase 2 is the Operational Impact Analysis, which evaluates vulnerability/security issues of the privatization initiative.

The recently developed DoDD No. 5160.54 requires the services to identify critical assets, ensure reliability, installation commanders to conduct annual reviews of their critical assets to include non-DoD infrastructures vital to their support, and to include a contractual requirement for cooperation in vulnerability assessments and assurance planning when contracting for private sector facilities, services and products, and consider all hazard assurance of service when awarding contracts.

AFEPPM 96-1 requires installations to determine their vulnerability to energy interruptions and to include these vulnerabilities, and actions to correct them, in the installation's Civil Engineer Contingency Response Planning, the Disaster Preparedness Planning and Operations, the Disaster Preparedness Operations Plan, and the Fire Protection AFI.

AFI 91-213 establishes the requirement for developing and managing tailored, mission specific operational management programs throughout the Air Force.

DoDI 2000.12 establishes, amongst other things, responsibilities for the protection of DoD personnel and their families, facilities, and other acts of terrorism.

AFI 31-209 gives the requirements for the Resource Protection Program and addresses the physical security of Air Force personnel, installations, operations, and assets.

AFI 31-210 establishes responsibilities and guidance for the Air Force Antiterrorism Program and integrates security precautions and defensive measures.

The IPT, in addition to identifying current available guidance, performed a table-top evaluation (see attachment) of the operational risk associated with the utilities privatization efforts. This was accomplished IAW the 5-M Model provided in AFP 91-214, Operational Risk Management Implementation and Execution, 1 September 1997. The 5-M Model provides a basic framework for analyzing systems and determining the relationships between composite elements that work together to perform the mission. The 5-Ms are Man, Machine, Media, Management, and Mission. We superimposed on the 5-Ms privatized utility operations to see the resultant element of risk. The IPT did not find a case

where the risk exceeded a level of medium. For every risk found, there were control measures available and in use in the Air Force today for mitigation and control decisions. Of interest, the IPT determined that the risk associated with utilities privatization are also associated with outsourcing in other programs.

In addition to the internal look-see the IPT contacted the Chief of Facility Management Department at Georgia Tech University (GTU) to measure our efforts with those of a large civilian organization. GTU owns its electric distribution and has no plans of conveying. They purchase water, wastewater, and gas services from the local area. They felt that privatizing the electric distribution would remove their leverage from negotiating for better prices on the purchase of electricity. There are no basis to support this assertion yet as deregulation has not been implemented in the State of Georgia. Vulnerability/security is addressed through contractual means. Critical systems are additionally supported with back systems.

Conclusion

Privatization is the transfer of control of a target business activity and associated assets to a public or private sector entity; characterized by the shift of responsibility to such an entity for the fundamental, long-term financial investment required to sustain the privatized activity.

As a result of transfer of control and assets, the Air Force will no longer retain the organic capability (at bases where we privatize) to operate, maintain, and repair these systems

Risks to the mission arise from potential direct impacts on operating capability due to loss of utility support (runway lighting system failure, loss of power to air traffic control systems) or indirect deficiencies of mission support capability resulting from extended or inappropriate degradation in utility support (extended power loss in quarters used by flightline maintenance personnel, drinking water contaminated due to inappropriate maintenance).

These negative impacts could arise from natural events (tornado, flood), accidents (auto crashes, explosions), market events (rate variances, labor actions), or sabotage (introduction of foreign substances to water systems, destroying or disabling key system components).

The draft OSD guidance for implementing this DRI allows for the Secretary to exempt utilities systems from privatization when “unique security reasons require the United States to own the system.”

“Unique security reasons” include ownership of the utility system by the private sector would constitute a significant threat to mission or safety of military personnel, compromise physical security of sensitive operations or property or create confusion that downgrades operational readiness.

Given that:

Risks associated with utilities privatization are manageable as they were commensurate with the risks if privatization were not to occur. The differences were in the mitigation procedures– mostly contractual language for privatized systems to address Air Force requirements IAW Air Force guidance.

Utility systems, as part of critical infrastructures, are under close scrutiny and oversight at all levels of DoD down to the installations.

Significant number of directives and oversight are in place to ensure utility service performance and continuity. And, the privatization process requires a mission impact analysis prior to the privatization of the utility under study.

There is sufficient empirical evidence to support the conclusion that vulnerability/security issues are being addressed and acted upon throughout the utilities privatization process.

Recommendation

- Mr. Peters consider current processes and oversight acceptable.
- The Air Force O&P Panel address vulnerability and security issues throughout the O&P process.
- SAF/AQC develop boiler-plate clauses for application in utility privatization contractual procedures

Introduction

The IPT reviewed several vulnerabilities related to utilities privatization and developed five major categories for detailed evaluation:

- Quality and availability of utilities (electric, water, sewage, natural gas)
- Ability to respond to contingencies and deployments
- Vulnerability to terrorist or criminal threat
- Vulnerability of base population
- Vulnerability of government liability

TABLE 1
Quality and Availability

HAZARD	Probability	Severity (Consequence)	Risk
Mission			
Poor electric power quality or availability	Seldom	Critical	Medium
Poor water quality or availability	Seldom	Critical	Medium
Poor sewage quality or availability	Seldom	Critical	Medium
Poor natural gas quality or availability	Seldom	Critical	Medium
Inability to establish priorities during emergency response	Occasional	Critical	Medium
Lack of 24-hour response capability	Seldom	Critical	Medium
Man			
Insufficient training	Seldom	Marginal	Low
Insufficient manning for normal operations	Seldom	Marginal	Low
Insufficient manning for surge operations	Occasional	Critical	Medium
Insufficient manning for service expansion	Likely	Marginal	Medium
Worker strike	Seldom	Critical	Medium
Insufficient Air Force personnel to operate back-up systems	Unlikely	Critical	Low

TABLE 1
Quality and Availability (Cont.)

HAZARD	Probability	Severity (consequence)	Risk
Media			
Delays for working in limited access areas	Seldom	Marginal	Low
Operation during THREATCON procedures	Likely	Marginal	Medium
Operating within Union environments	Likely	Marginal	Medium
Machine			
Unwillingness to make system upgrades (inefficient systems, or high pollution.)	Seldom	Marginal	Low
Inadequate infrastructure maintenance	Occasional	Marginal	Medium
Insufficient equipment for normal operations	Unlikely	Critical	Low
Insufficient equipment for surge operations	Occasional	Critical	Medium
Insufficient equipment for service expansion	Likely	Marginal	Medium
Insufficient Air Force operated emergency back-up systems	Occasional	Critical	Medium

TABLE 1
Quality and Availability (Cont.)

HAZARD	Probability	Severity (consequence)	Risk
Management	Seldom	Marginal	Low
Inadequate/untimely supply system	Seldom	Marginal	Low
Union restrictions in contract/operations	Unlikely	Critical	Low
Lack of service during contract negotiations/disputes	Seldom	Marginal	Low
Inadequate AF oversight Inadequate HHQ oversight	Seldom	Negligible	Low

TABLE 2
Ability to Respond to Deployments

HAZARD	Probability	Severity (consequence)	Risk
Mission			
Inability to support contingencies	Seldom	Critical	Medium
Man			
Lack of deployable UTCs	Seldom	Critical	Medium
Machine			
Insufficient AF owned deployable systems	Seldom	Critical	Medium

TABLE 3
Vulnerability to Threats from Terrorism, Criminal Acts or
Low Intensity Conflict

HAZARD	Probability	Severity (consequence)	Risk
Man			
Gives terrorist access to base, equipment and utilities information	Seldom	Critical	Medium
Gives criminals access to base and equipment	Occasional	Marginal	Medium
Media			
Union protection of suspected criminals	Seldom	Marginal	Low

TABLE 4
Vulnerability of Base Population

HAZARD	Probability	Severity (consequence)	Risk
Man			
Gives criminals access to base housing and population	Occasional	Critical	Medium
Media			
Union protection of suspected criminals or ex-convicts	Seldom	Marginal	Low

TABLE 5
Vulnerability of Government Liability

HAZARD	Probability	Severity (consequence)	Risk
Mission			
Government action could greatly change scope of contract (BRAC, bring in new wing, etc.)	Occasional	Critical	Medium
Loss of service during contract disputes	Unlikely	Critical	Low
Loss of service due to contractor bankruptcy	Unlikely	Critical	Low
Man			
Health, welfare, personal injury liability	Occasional	Marginal	Medium
Media			
Environmental liability for contractor actions	Occasional	Marginal	Medium
Machine			
Claims for technical data for equipment and infrastructure	Likely	Marginal	Medium
Management			
Unacceptable rate negotiations	Occasional	Marginal	Medium

Risk Assessment

Risk assessment methodology and risk values come from AFP 91-215, Operational Risk Management (ORM), Guidelines and Tools. A summary of the methodology is included here.

The first step in the risk assessment process is to identify hazards. Hazards are any real or potential condition that can cause mission degradation, injury, or death. Hazards can be hypothesized by functional expert brainstorming, review of applicable documents, evaluations of representative organization, and by use of the Air Force Safety Centers 5-M (Management, Mission, Man, Machine, Media) Risk Identification Model. Hazards are then validated by inspection, interview, and survey.

Once the hazards are validated, two questions are asked for each hazard; what is the consequence or severity if the hazard occurs, and what is the likelihood of occurrence? Severity is subjectively assessed based on the collective experiences of the IPT team and expressed as one of the four categories presented in Table 6. The probability of occurrence is assessed based on quantitative data, interviews, organization visits, surveys, and the IPT team's experience. Probability is expressed as one of the five terms presented in Table 6.

Risk is the product of the severity and the probability of a hazard occurring. Risk, determined from the Risk Assessment Matrix (Table 7), is expressed as one of three qualitative values; Low, Medium, or High.

TABLE 6
Hazard Probability and Severity

HAZARD PROBABILITY	SEVERITY CATEGORIES
<p>Frequent</p> <ul style="list-style-type: none"> Individual item – Occurs often Fleet – Continuously experienced <p>Likely</p> <ul style="list-style-type: none"> Individual item – Occurs several times Fleet – Occurs frequently <p>Occasional</p> <ul style="list-style-type: none"> Individual item – Will occur Fleet – Occurs several times <p>Seldom</p> <ul style="list-style-type: none"> Individual item – Unlikely but could occur Fleet – Unlikely but can expect to occur <p>Unlikely</p> <ul style="list-style-type: none"> Individual item – So unlikely you assume it will not occur Fleet – Unlikely but could occur 	<p>Catastrophic</p> <ul style="list-style-type: none"> Complete mission failure, death, or loss of system <p>Critical</p> <ul style="list-style-type: none"> Major mission degradation, sever injury, or major system damage <p>Marginal</p> <ul style="list-style-type: none"> Minor mission degradation, injury, or minor system damage <p>Negligible</p> <ul style="list-style-type: none"> Less than minor mission degradation, injury, or minor system damage

TABLE 7
Risk Assessment Matrix

	FREQUENT	LIKELY	OCCASIONAL	SELDOM	UNLIKELY
Catastrophic	High	High	High	Medium	Low
Critical	High	High	Medium	Medium	Low
Marginal	Medium	Medium	Medium	Low	Low
Negligible	Low	Low	Low	Low	Low

Risk can potentially be reduced by mitigating either the probability or severity of the hazard or both. The probability, in some cases, can be mitigated by a change in procedures or location. Severity is often mitigated with additional safeguards or backup equipment.